REMARKS

This paper is filed in response to the Office Action mailed on January 19, 2007. Presently, Claims 1, 5, 7, 15, 17, 20-30, 32-44, 47, 48, 52, 53, and 63-65 are pending in the application. Of these, Claims 20-30, 32-44, 47, 48, 52, 53, 64, and 65 are withdrawn from consideration. Claims 1, 5, 7, 15, 17, and 63 have been examined and stand rejected. Reconsideration of Claims 1, 5, 7, 15, 17, and 63 is respectfully requested.

The Objection Under 35 U.S.C. § 132(a)

The amendment filed February 7, 2005, is objected to under 35 U.S.C. § 132(a) because it purportedly introduces new matter into the disclosure. Claim 1 has been amended. Applicant submits the objection has been overcome.

The Rejection of Claims 1, 5, 7, 15, 17, and 63 Under 35 U.S.C. § 112, First Paragraph

Claims 1, 5, 7, 15, 17, and 63 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claim 1 has been amended. Applicant submits the objection has been overcome.

The Rejection of Claims 1, 5, 7, and 15 Under 35 U.S.C. § 103(a)

Claims 1, 5, 7, and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,852,567 (hereinafter "Sinofsky") in combination with U.S. Patent No. 4,998,932 (hereinafter "Rosen et al."), U.S. Patent No. 5,982,801 (hereinafter "Deak"), and the purportedly admitted prior art.

Claim 1 is related to a method for providing sonoluminescent light inside a mammalian body for a medical purpose. The method includes placing at least a distal portion of an elongated medical device with a source for producing sonoluminescent light at a distal tip thereof inside the body and providing one or more high voltage pulses to the electrodes to emit sonoluminescent light from the source inside the body for the medical purpose.

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The prior art does not render obvious a method comprising placing a source of sonoluminescent light at the distal tip of an elongated medical device for producing sonoluminescent light inside the body for a medical purpose, as recited in Claim 1. The sonoluminescent light source of Claim 1 includes a housing that is shaped to reflect and concentrate acoustic waves within an enclosed acoustic conducting medium; a piezoelectric transducer; a wave matching layer positioned adjacent the piezoelectric transducer; a focusing lens having a flat surface adjacent the wave matching layer and a concave surface adjacent the acoustic conducting medium that focuses on waves in the acoustic conducting medium; and at least two electrodes for delivering pulses to the piezoelectric transducer and the wave matching layer.

Placing the sonoluminescent light source at the distal tip eliminates the need for expensive proximally located light sources, and providing one or more high voltage pulses to the electrodes can produce short duration light waves allowing safe operation without heating effects. (Page 3, lines 6 to 10.)

Sinofsky describes a catheter having an optical waveguide for transmitting radiation of a particular wavelength range through the catheter to a radiation generating means attached to the distal end of the catheter, wherein the radiation generating means is responsive to the radiation transmitted by the waveguide to produce radiation of a different wavelength. (Col. 2, lines 35-48.) The purpose is to enable use of a relatively inexpensive and commonly used waveguide material, such as silica. (Col. 1, lines 43-45.) However, a silica waveguide cannot transmit some desirable wavelengths, such as mid-infrared radiation. (Col. 1, lines 46-48.) Because the optical waveguide cannot pass the desired wavelength range efficiently, a radiation generating means at the distal tip of the catheter comprises a laser crystal that is responsive to the radiation wavelength that can pass through the optical waveguide without much attenuation. The

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laser crystal is able to produce the desired output wavelength range. The laser crystal is optically excited by laser radiation in the 0.7 to 0.8 micrometer range (which easily passes through a silica optical fiber). The known term for this type of energy excitation is "laser pumping." (Col. 2, lines 8-12; Col. 2, lines 57-69.)

Rosen et al. describes a catheter having at least one semiconductor chip for emitting radiation from the distal end of the catheter. The semiconductor chip receives electrical energy through electrical conductors extending from the distal end to the proximal end. The electrical conductors 18 and 20 are electrically isolated from each other by the insulator 16. (Col. 3, lines 44-52.) The semiconductor chip 28 is arranged to receive electrical power applied to the proximal ends of the conductors. The semiconductor chip 28 may generate electromagnetic radiation in the form of light through microwave radiation useful for heating. (Col. 4, lines 15-25.)

Deak describes a sonoluminescent device without describing its suitability in a medical device for placement inside the body. Deak describes the primary goal of this device is not to have pumping action take place; instead, the water remains within the chamber for the purpose of creating cavitation within the water, which creates the sonoluminescent light. (Col. 16, lines 8-26.)

The Examiner states that the laser of Sinofsky can be replaced with the laser of Deak, since Sinofsky teaches a variety of laser configurations and since the laser of Deak only requires a few parts and no optical fibers, since only electrical energy need be transmitted through the catheter, which increases energy transmission and does not require matching transmission wavelengths.

An error committed by the Examiner is to overstate the teachings of Sinofsky. Sinofsky does not teach a variety of laser configurations.

Sinofsky is directed to providing a variety of *laser crystals*, which can be excited by radiation of a particular wavelength carried without much attenuation via the optical waveguide. Sinofsky explicitly teaches the laser crystal 32 at the distal end of the catheter is preferably selected from a variety of rare earth ions in a suitable host material, such as yttrium aluminum garnet, yttrium lithium fluoride, or yttrium scandium gadolinium garnet. The selected rare earth ion depends on the desired output wavelength. In a preferred embodiment, the laser crystal 32 is erbium-doped yttrium aluminum garnet having an output wavelength of 2.94 micrometers or holmium-doped yttrium aluminum garnet having an output wavelength of 2.06 micrometers. Preferably, the optical fiber 16 is silica for low cost, non-toxicity, and flexibility, and the laser crystal 32 is optically pumped by a laser radiation in the 0.7 to 0.8 micrometer range. (Col. 5, lines 28-41.) Thus, the variety of "lasers" contemplated by Sinofsky are limited to laser crystals comprising rare earth materials and the like capable of being optically laser-pumped.

In contrast to optically-pumped laser crystals, the laser of Deak operates by applying a very high energy density *acoustic radiation pressure* field from a drive circuit applied to a transducer. The energy density is further increased by utilizing a tapered guide 12 and a parabolic transducer 8, which further concentrates the acoustic energy density. When the acoustic energy density increases beyond a certain value, cavitation occurs within the water and the microbubbles form a cluster 23 near the window 24. These microbubbles expand and contract in unison with the emitted ultrasound and during the collapse phase of this activity, blue light is emitted through the window 24. This phenomenon is a form of sonoluminescence.

Accordingly, the laser of Deak does not provide a suitable replacement for incorporation at the distal tip of the catheter of Sinofsky.

The Examiner further commits error by overstating the teachings of Rosen et al. The Examiner states that Rosen et al. teaches the desirability of employing electrical conductors in

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the place of optical fibers. However, Rosen et al. never teaches this. Rosen et al. is not making an evaluation of optical fibers and electrical conductors and making a decision which is better between the two. Furthermore, replacing the optical waveguide of Sinofsky with electrical conductors would simply render the device of Sinofsky unsuitable for its intended purpose because electrical conductors cannot transmit the light energy from the pumping laser to the laser crystal.

In summary, the device of Sinofsky cannot function with electrical conductors in place of optical fibers, nor can the device of Sinofsky function with a sonoluminescent device in place of the laser crystal.

Because the references relied upon by the Examiner teach away from the combination of elements as recited in Claim 1, Claim 1 cannot be considered obvious therefrom.

Accordingly, the withdrawal of the rejection of Claims 1, 5, 7, and 15 is respectfully requested.

The Rejection of Claims 17 and 63 Under 35 U.S.C. § 103(a)

Claims 17 and 63 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sinofsky in combination with Rosen et al., Deak, and the purportedly admitted prior art, and further in view of U.S. Patent No. 5,659,173 (hereinafter "Putterman et al.").

Claims 17 and 63 are dependent from Claim 1, which is submitted to be allowable; therefore, Claims 17 and 63 should likewise be allowable.

The Supplemental Information Disclosure Statement

The Supplemental Information Disclosure Statement mailed on October 31, 1997, has not been acknowledged and returned to applicant, a copy of which is enclosed including verification in the form of a postcard stamped with a receipt date of November 3, 1997, which is within three

months from the date of filing the application, and therefore, the references cited in the Supplemental Information Disclosure Statement are entitled to consideration as a matter of right.

Accordingly, the Examiner is respectfully requested to review the references and return an initialed copy with the next Office communication.

CONCLUSION

In view of the foregoing amendments and remarks, applicant submits that the application is in condition for allowance. If the Examiner has any further questions or comments, the Examiner may contact the applicant's attorney at the number provided below.

Respectfully submitted,

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